

# Viticulture

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[viticulture.colostate.edu](http://viticulture.colostate.edu)

Amateur Winemaking 101



**ENGAGEMENT  
AND EXTENSION**  
 COLORADO STATE UNIVERSITY

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- Virginia wine industry
  - Ranked 6<sup>th</sup> in wineries, 10<sup>th</sup> in wine production
  - 280 wineries across the state
  - Focus on sweeter wines
  - Mixture of cold hardy and old-world varieties
  - Season description
    - Late-Mar. – Early-Oct.
    - Average 35" rain, abundance of rots

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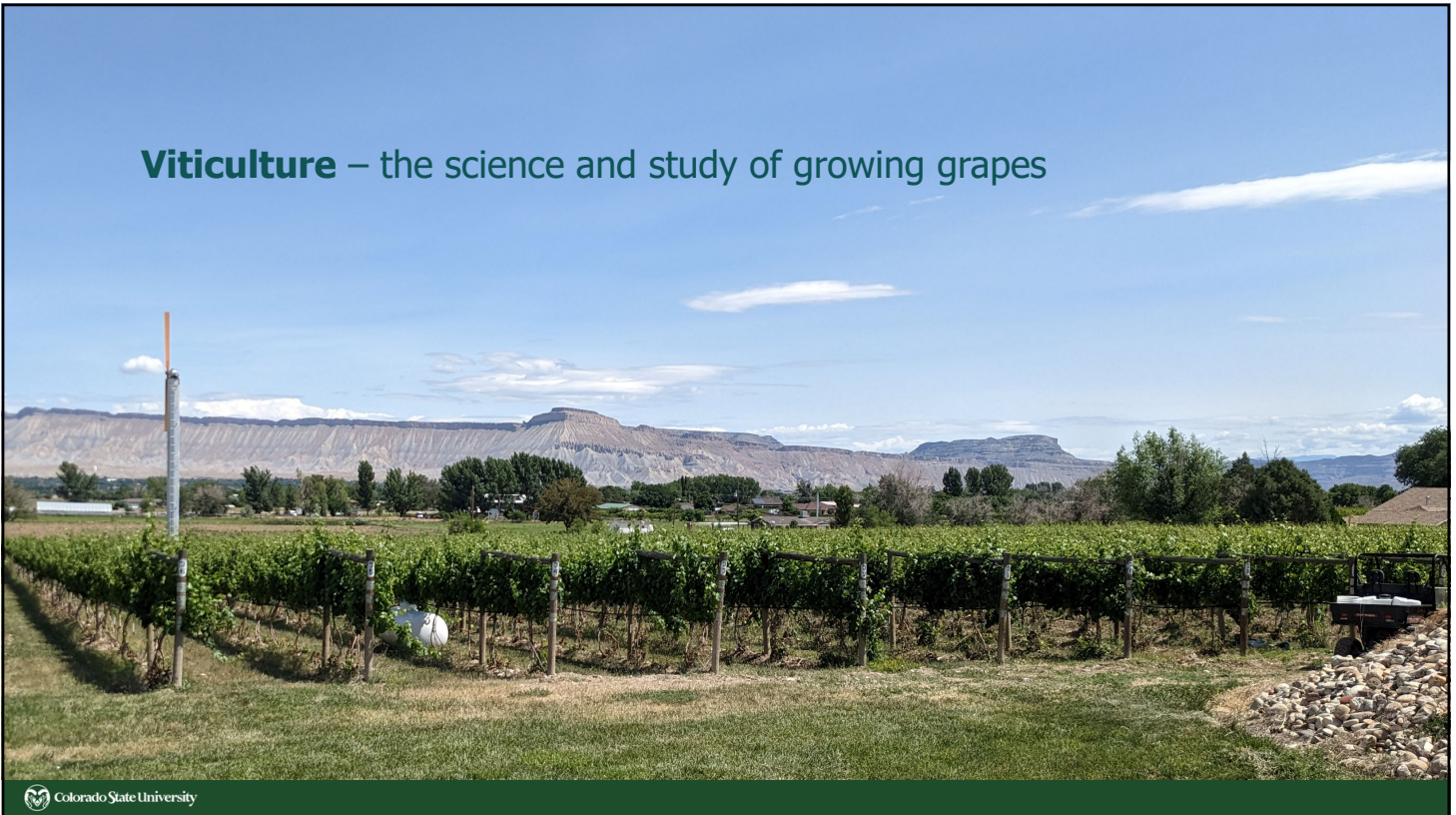
## What is the Viticulture Extension Specialist?

- First position of its kind at CSU – 50% CSU, 50% industry (YOU)
- Role – Anything pertaining to outreach
  - Workshops, webinars, factsheets, grower forums/interactive spaces
  - On-site consultations and issue follow-ups
  - Assist local extension offices with grape questions and training
  - Research areas that can't be addressed by Dr. Caspari



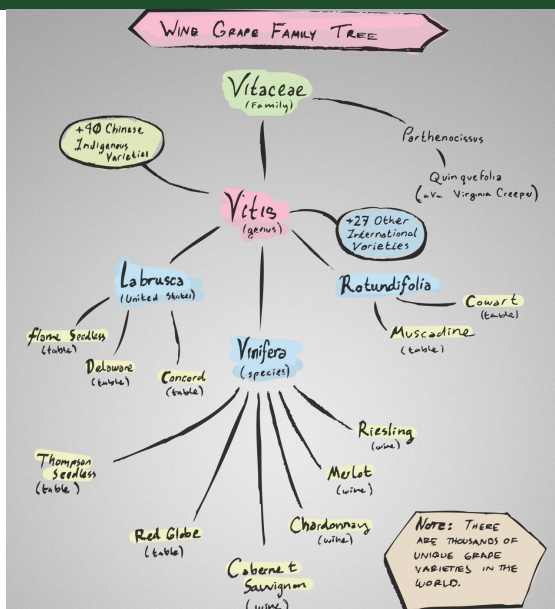
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## Viticulture – the science and study of growing grapes



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## What is a grape?

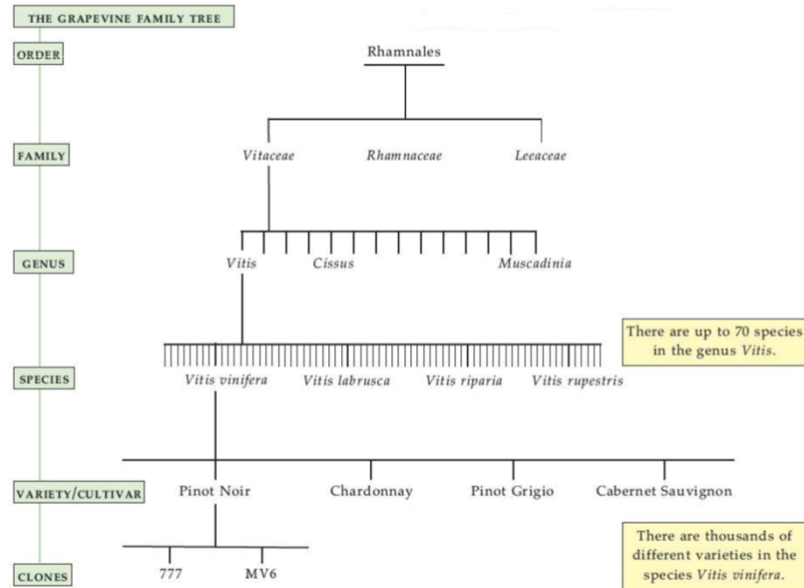


- *Vitis vinifera*
- Two subgenera
  - *Euvinis* – 38 chromosomes
  - *Muscadinia* – 40 chromosomes
- Deciduous liana with loose bark and alternating, lobed leaves
- Found in temperate regions worldwide
- Dual domestication assumed 11,000 yrs ago
- Interbreeding is common

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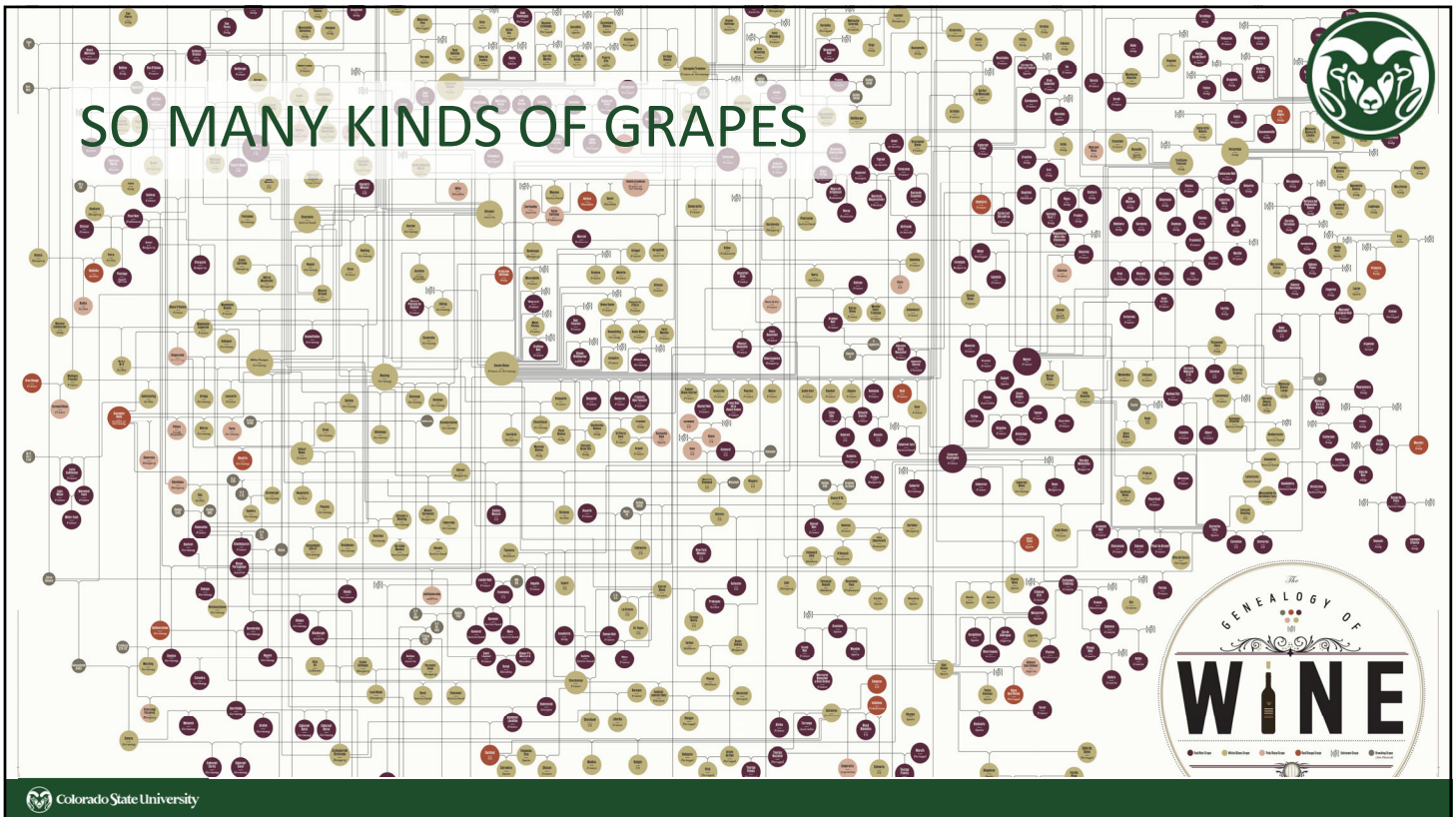


# What is a grape?

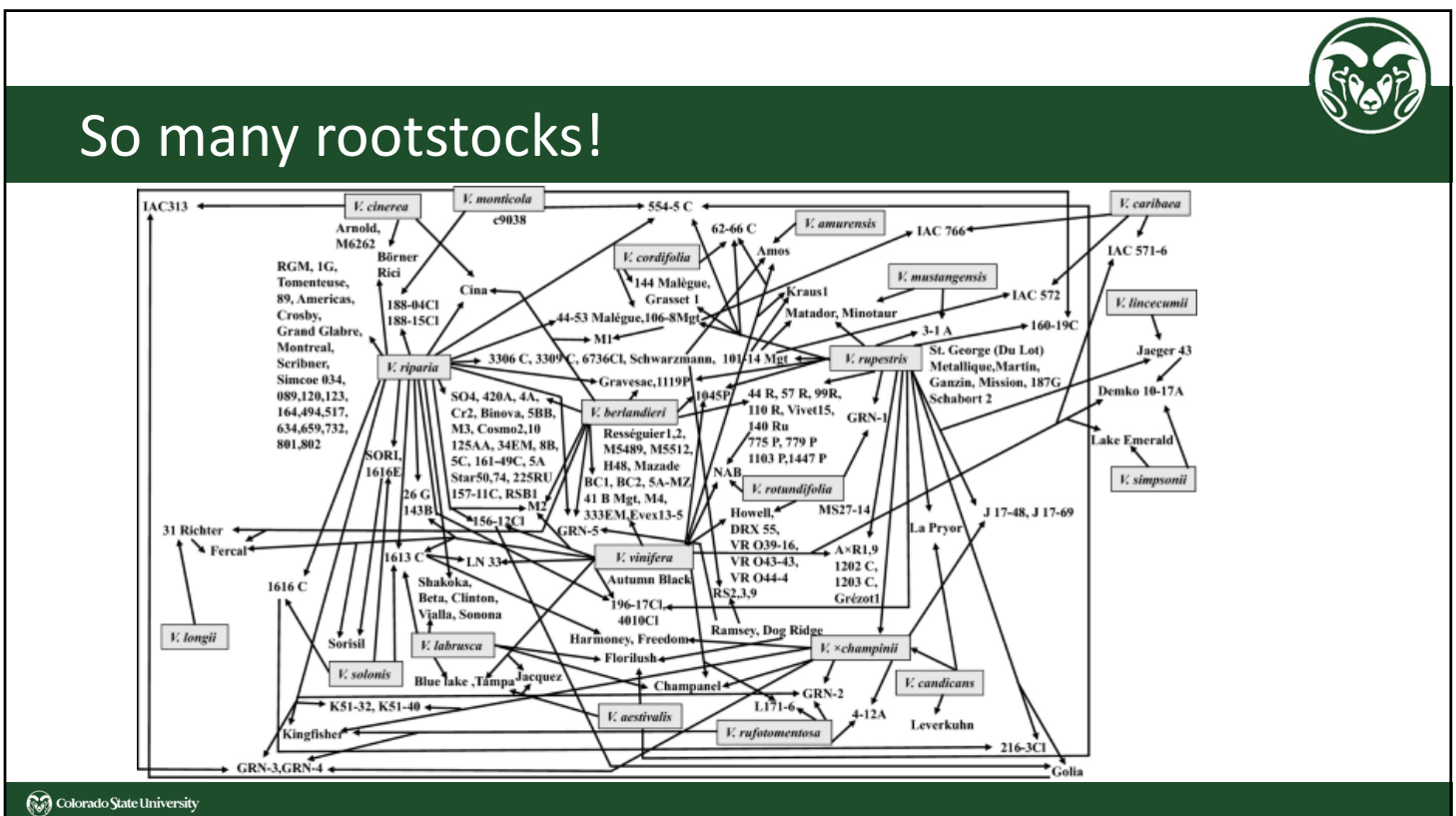


# SO MANY KINDS OF GRAPES





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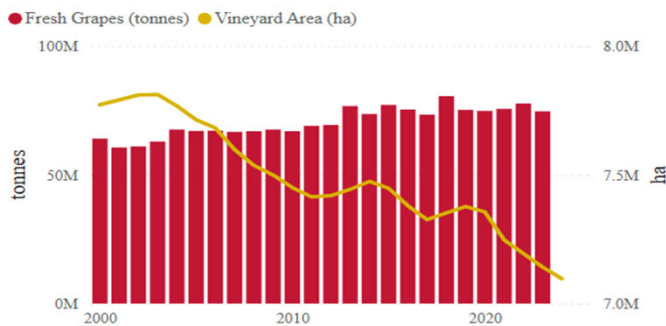


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# Global Grape Production

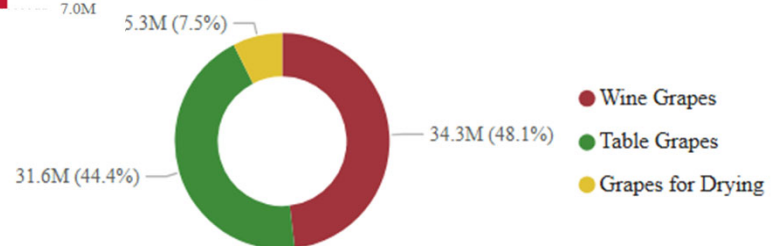
Fresh Grapes Production & Vineyard Area



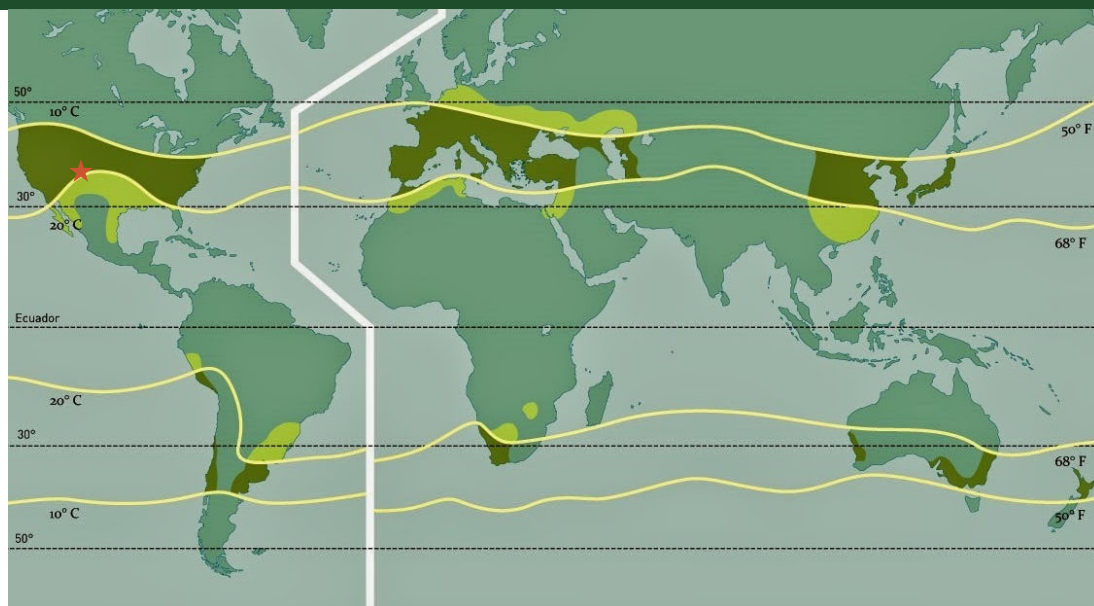
- 1<sup>st</sup> – Spain (930)
- 2<sup>nd</sup> – France (783)
- 3<sup>rd</sup> – China (753)
- 4<sup>th</sup> – Italy (728)
- 5<sup>th</sup> – Turkey (402)
- 6<sup>th</sup> – USA (385)

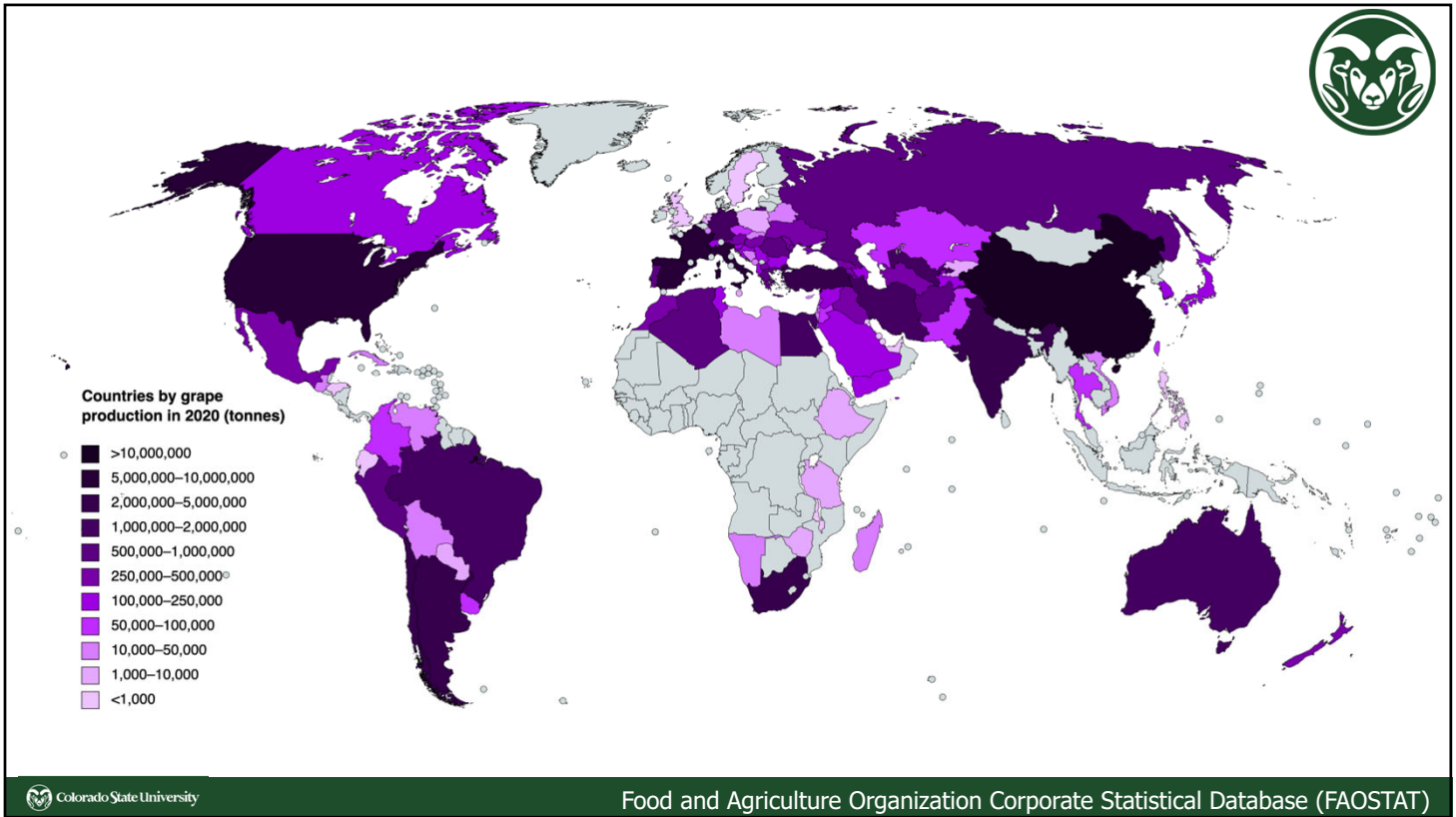
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Grapes Production (tonnes)

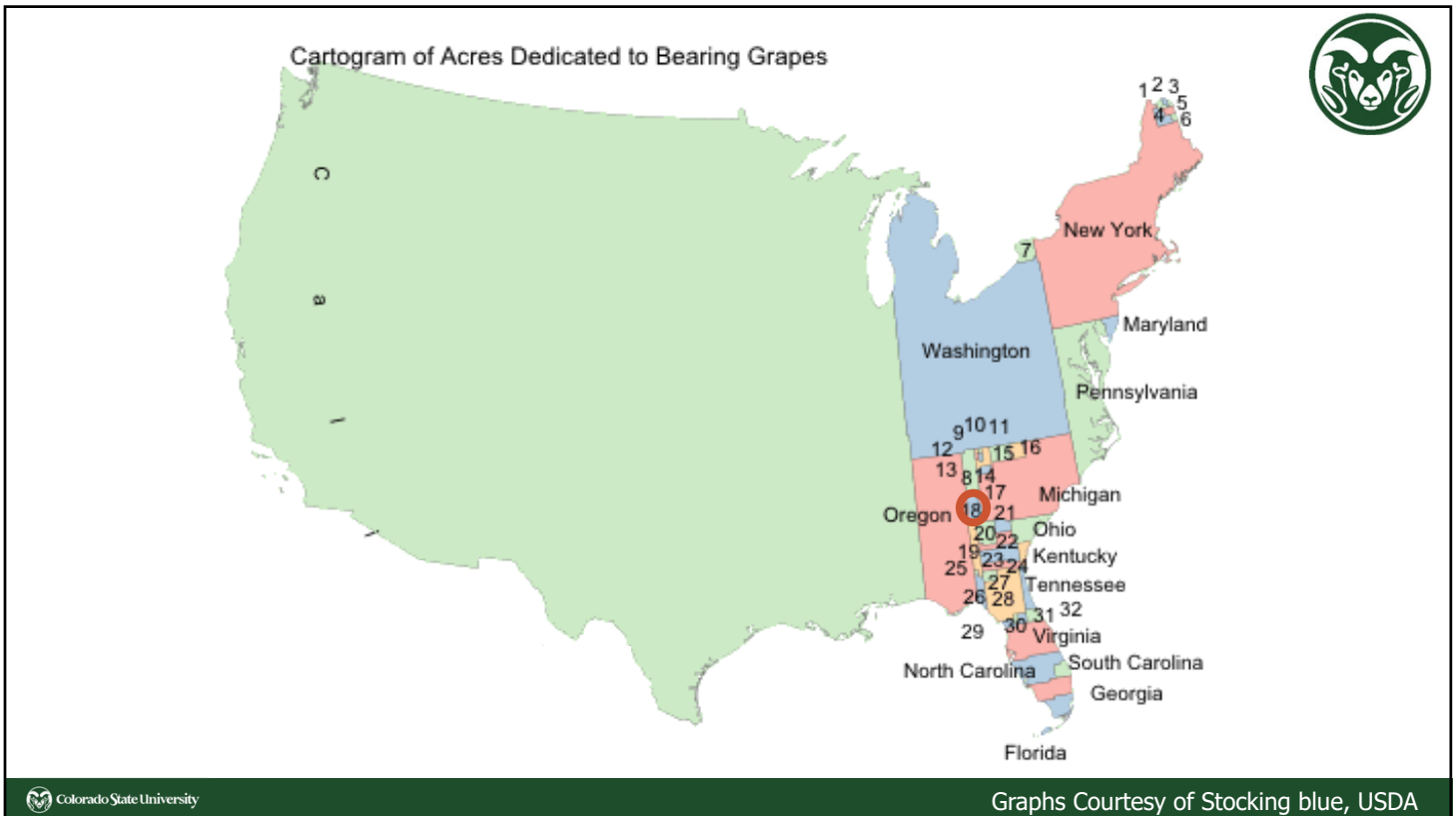


# Vineyard production zones

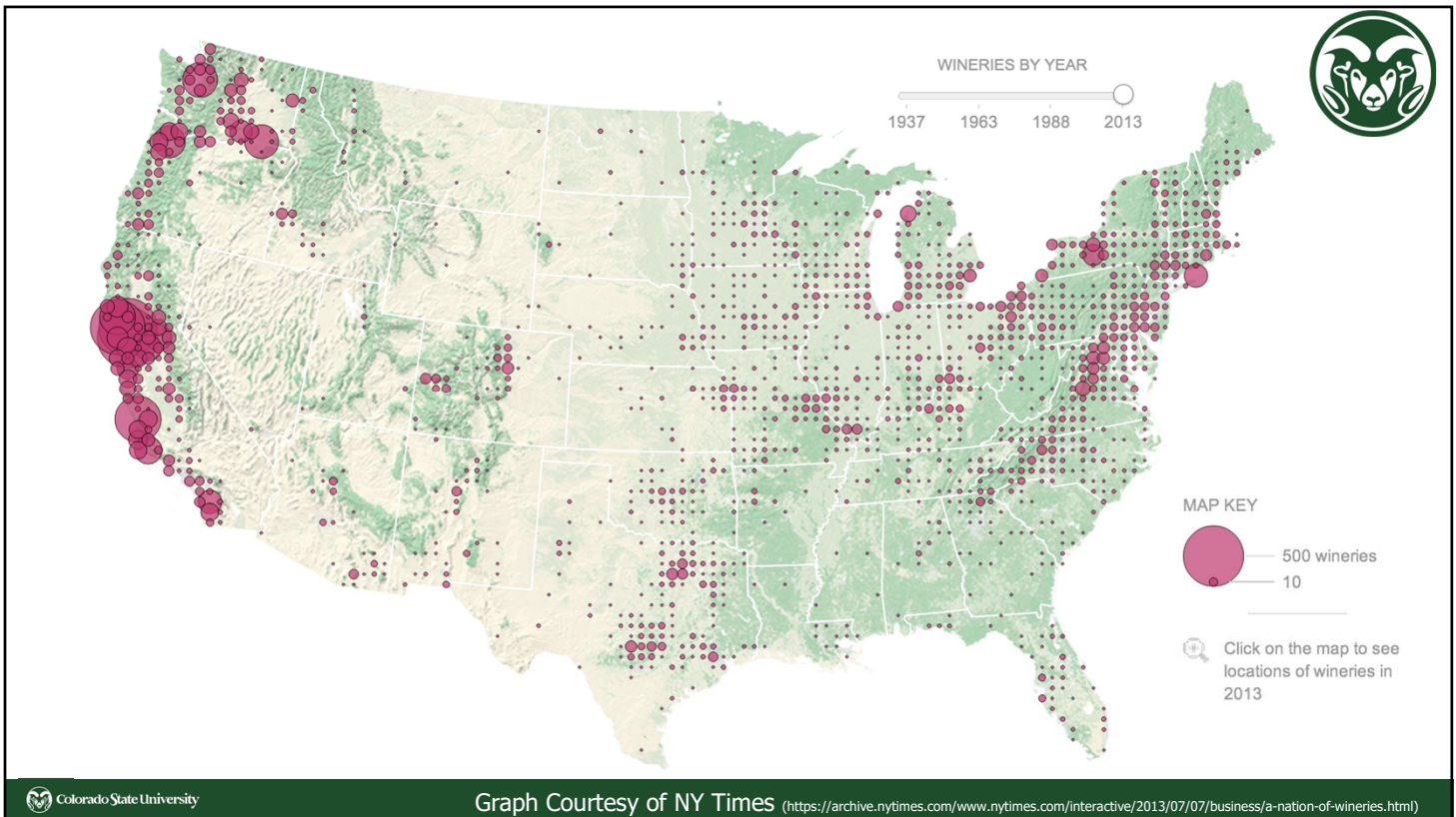




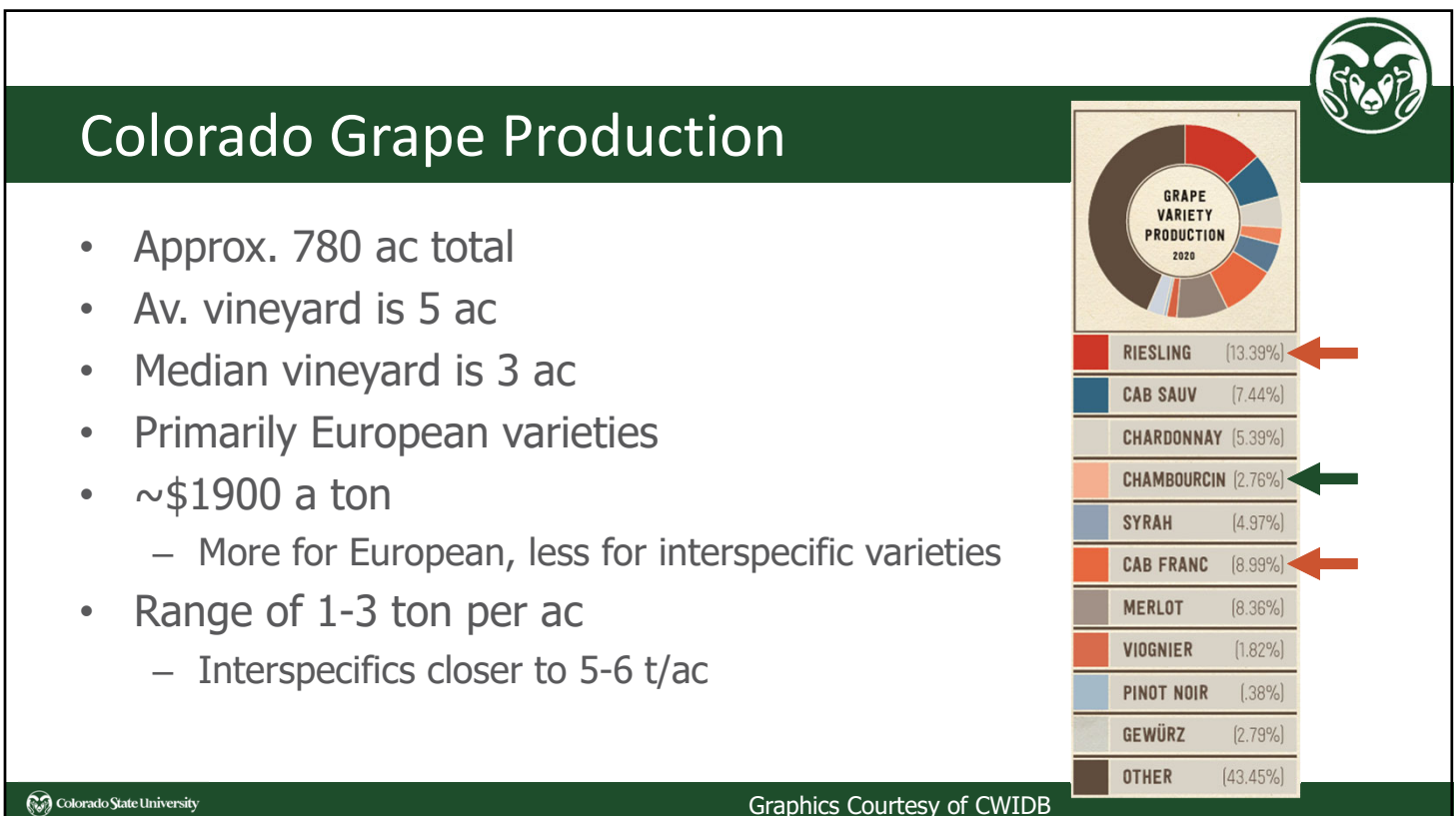
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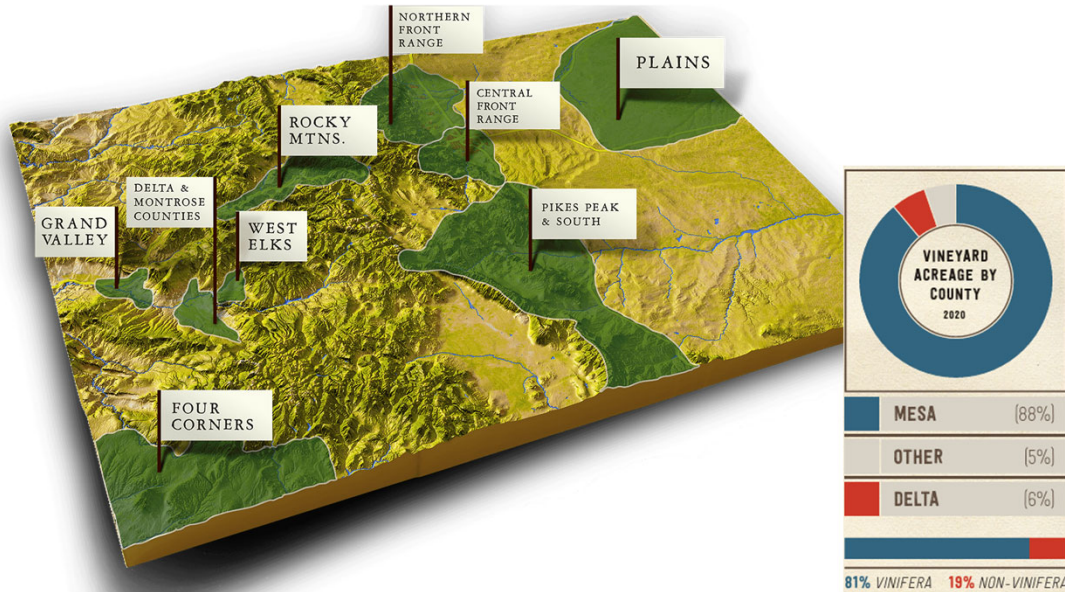
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# Colorado Grape Production



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Graphics Courtesy of Colorado Wine Industry Development Board

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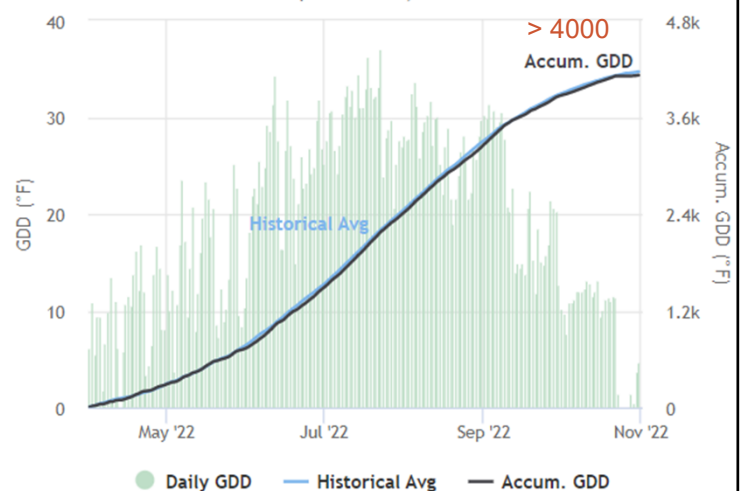


# Climatic Requirements

- Minimum requirements
  - GDD – cultivar dependent
  - Frost Free Days = 150-180 days
- Colorado grapes are at 4,000-7,000 ft elevation
  - Temperatures decrease as elevation increases
  - Fewer frost-free days
  - GDDs is not always too low

## Growing Degree Days for CSU Orchard Mesa Research Sta (ORM02)

Apr 1 - Oct 31, 2022



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Graph courtesy of CoAgM et

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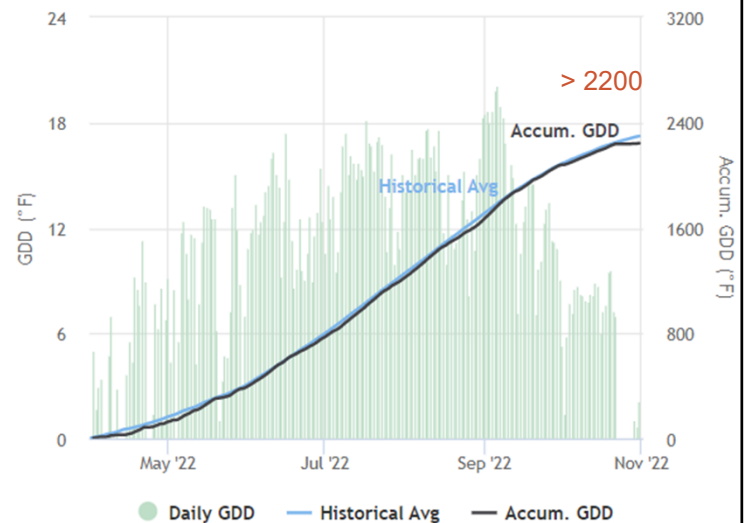


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## Growing Degree Days for Gunnison (GUN01)

Apr 1 - Oct 31, 2022



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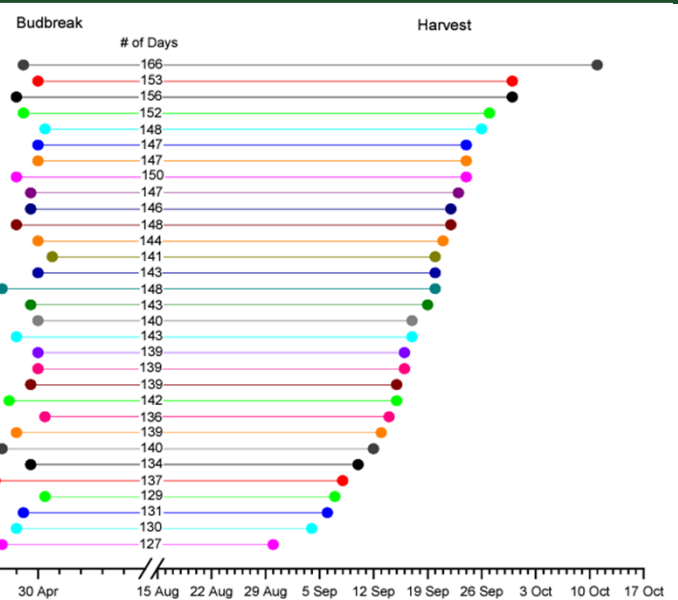
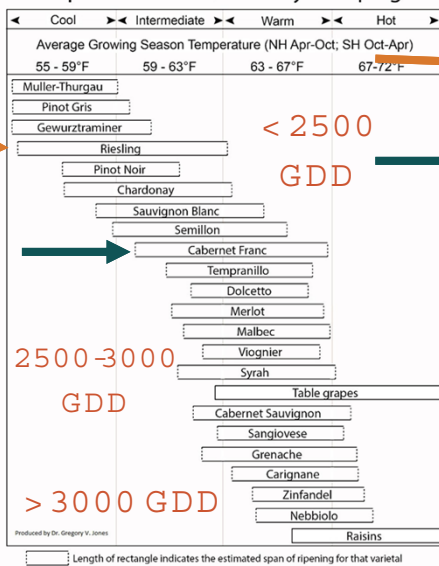
Graph courtesy of CoAgM et

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# Climatic Requirements

## Grapevine Climate/Maturity Groupings



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Diagram courtesy of Dr. Gregory Jones

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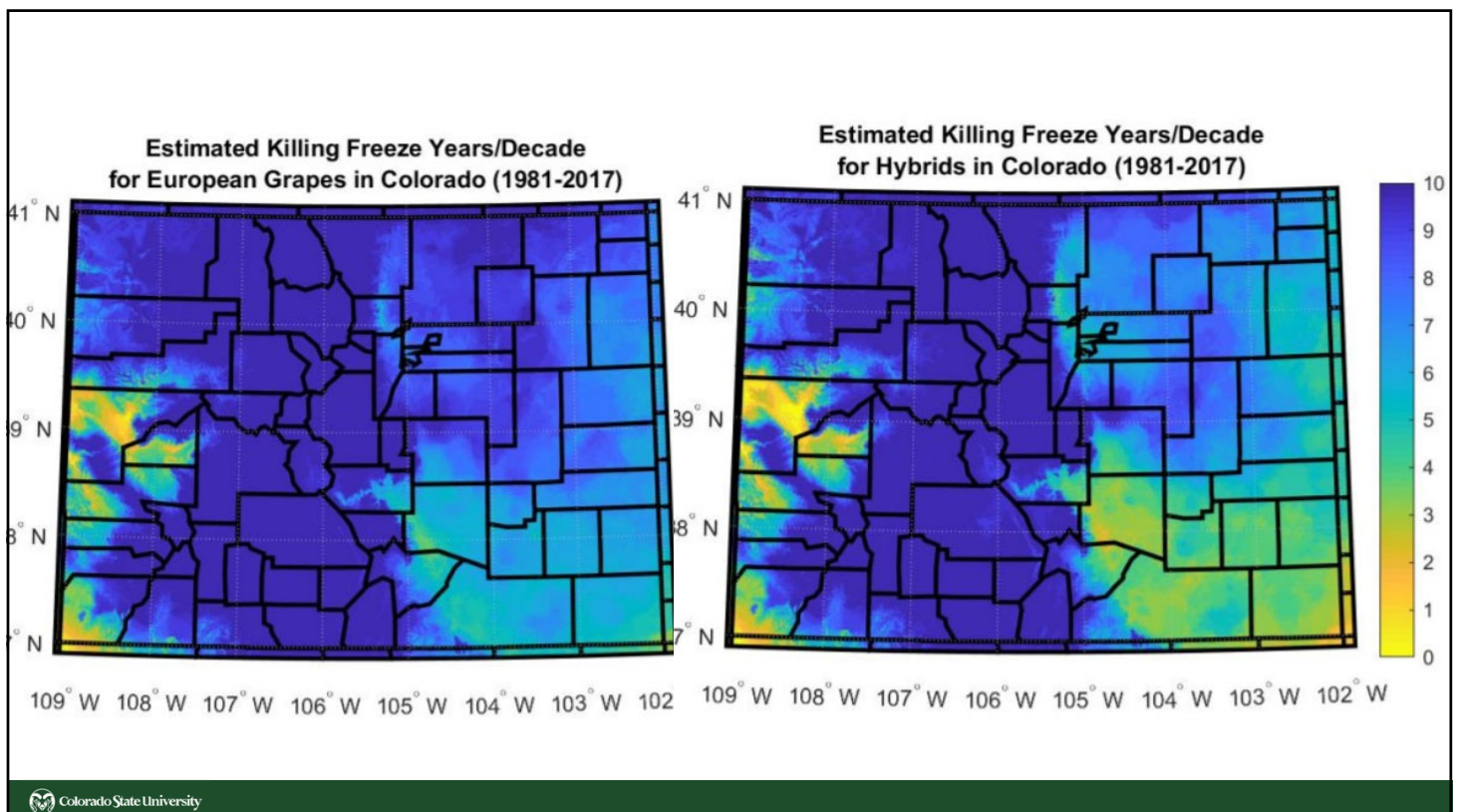
## Unique climatic conditions

- All of the state is high elevation
  - 4,500 – 7,000 ft in absolute elevation
  - Deep cold winters
- Soils are basic, can be high in calcium sulfates and carbonates, and are highly variable



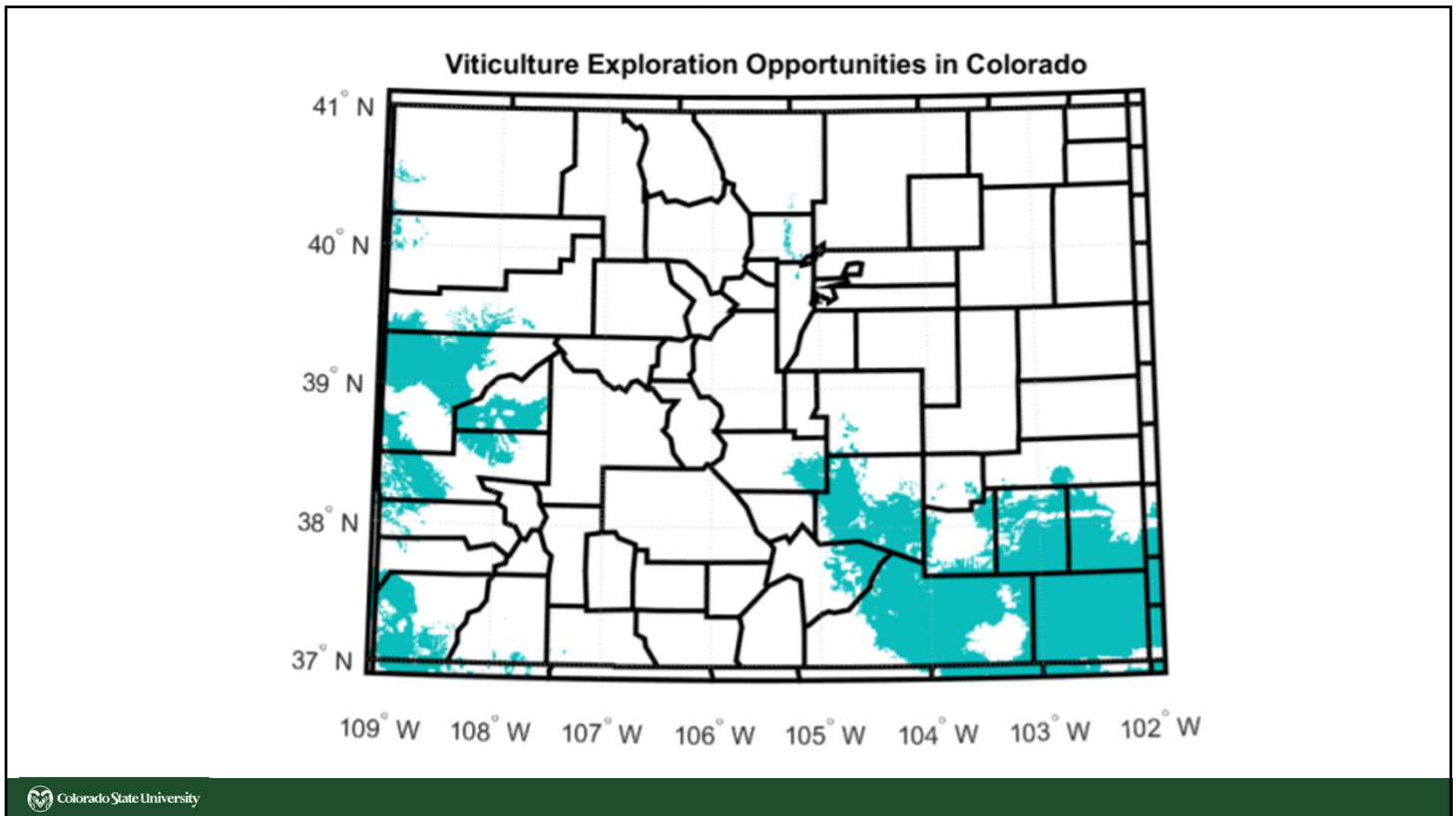
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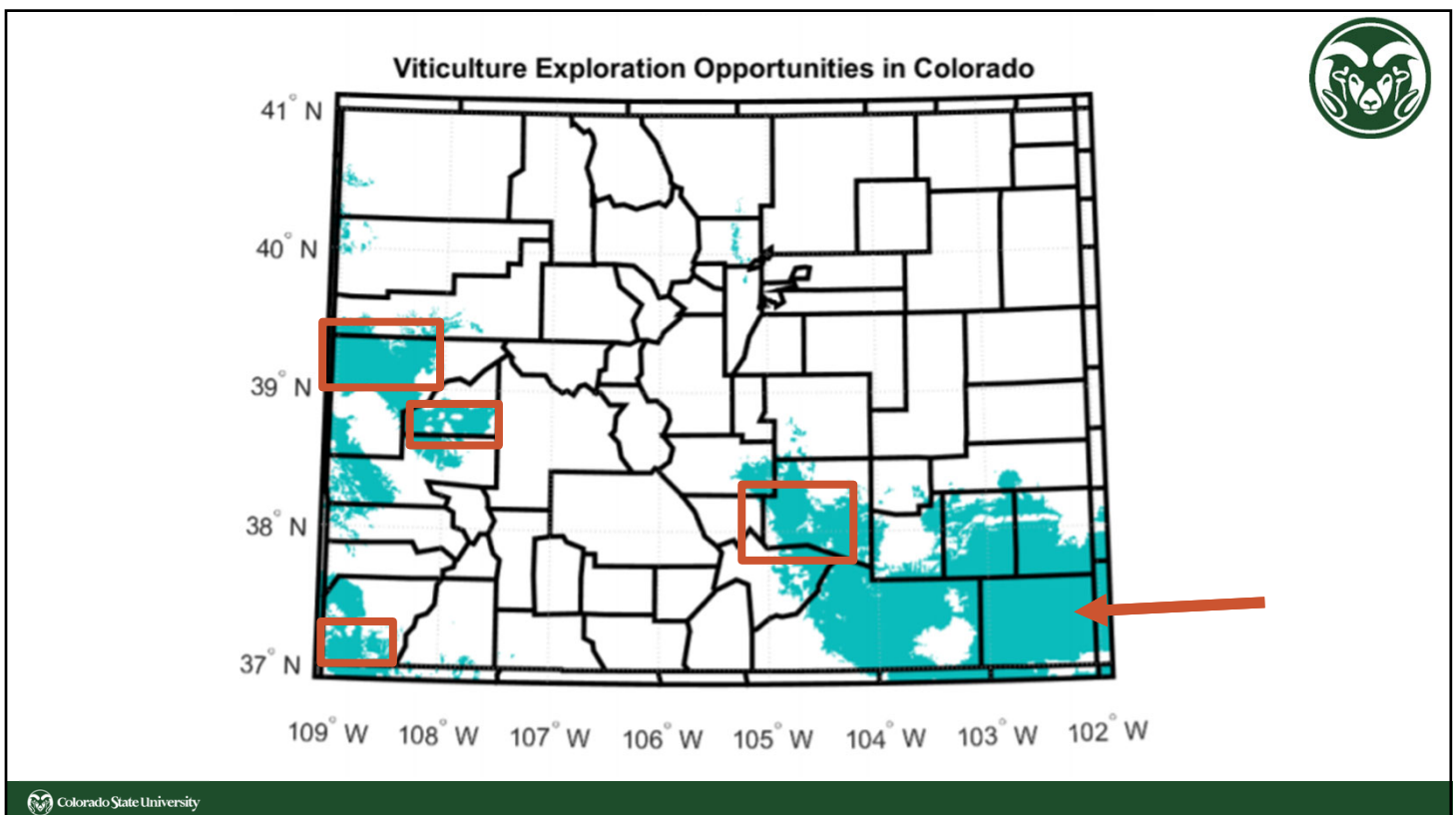


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## Variety trials

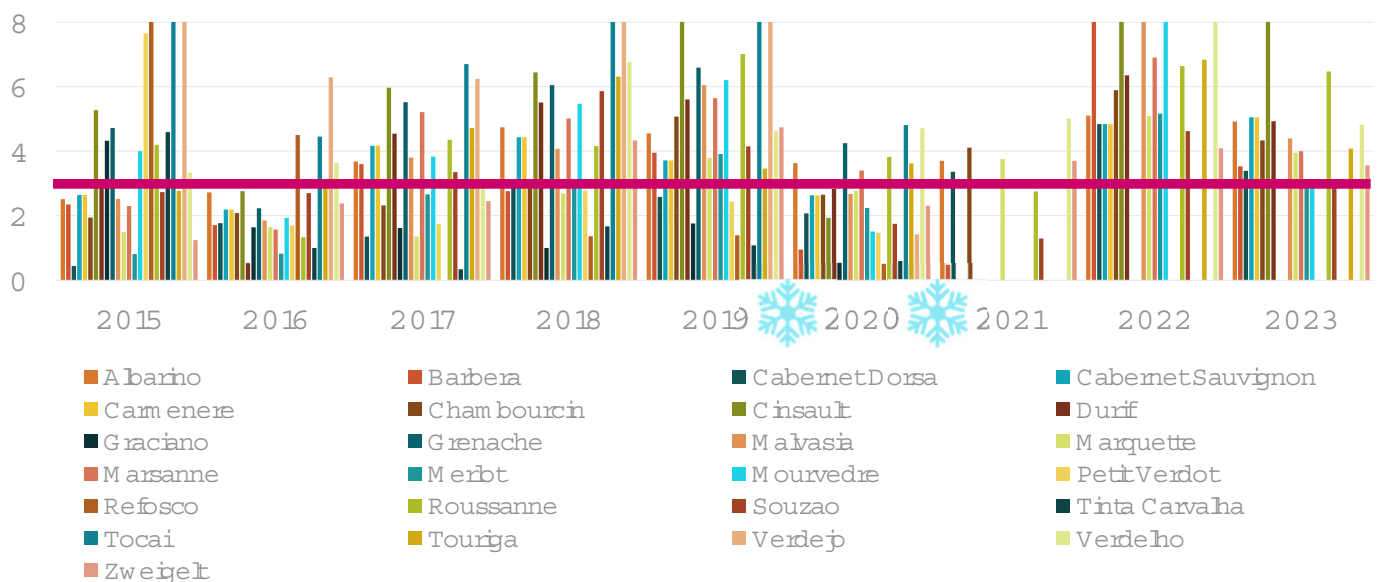
Variety	Harvest (Av.)	Vine survival (%)	Variety	Harvest (Av.)	Vine survival (%)
Albarino	Sep.14	92%	Merbt	Sep.10	71%
Barbera	Oct.8	54%	Mourvedre	Oct.10	83%
CabernetDorsa	Aug.31	71%	PetitVerdot	Oct.8	75%
CabernetSauvignon	Oct.2	96%	Refosco	Sep.28	100%
Cam enere	Oct.8	100%	Roussanne	Sep.19	54%
Cham bourn	Sep.28	75%	Souzao	Oct.5	67%
C nsault	Oct.4	63%	Tinta Carvaha	Oct.10	100%
Durif	Oct.10	79%	TocaiFriulano	Oct.7	8%
Graciano	Sep.26	96%	Touriga nacional	Oct.3	46%
Grenache	Oct.11	54%	Verdej	Oct.7	8%
Malvasia bianca	Sep.10	75%	Verdeho	Sep.8	63%
Marquette	Aug.18	71%	Zweigelt	Sep.9	96%
Marsanne	Sep.24	54%			

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## Results – Orchard Mesa Research Station

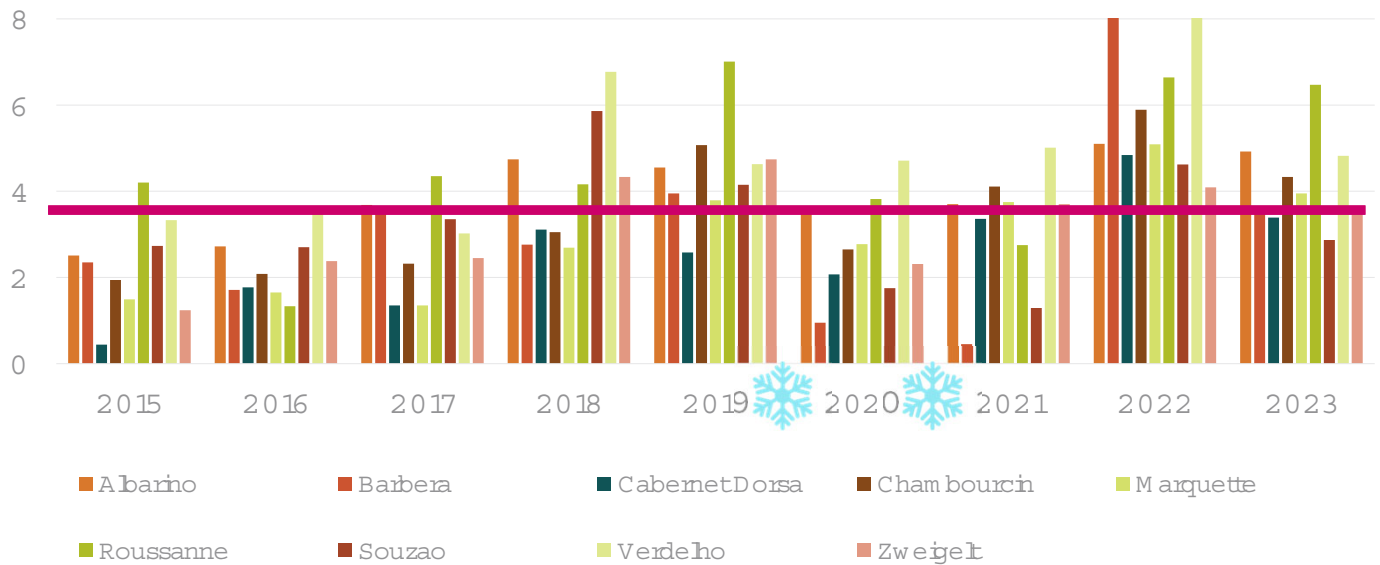


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## Results – Orchard Mesa Research Station



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## Unique climatic conditions

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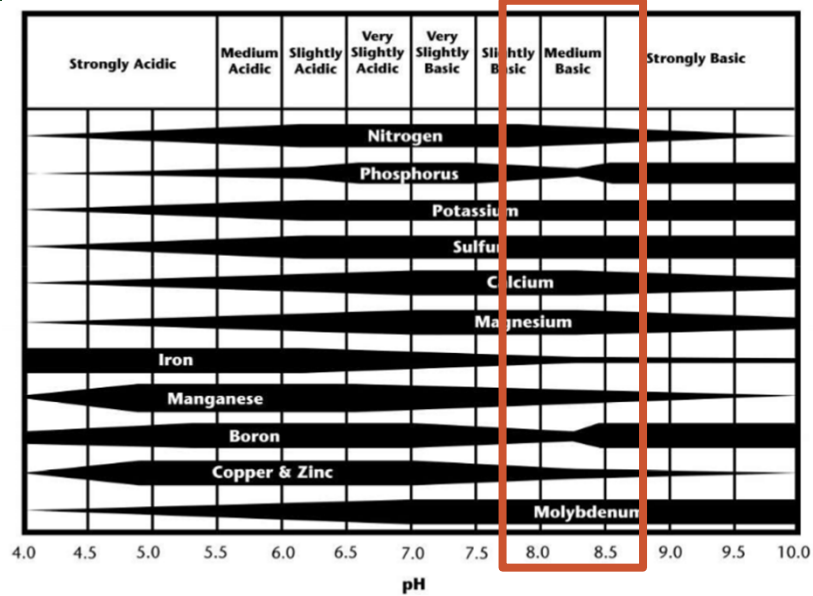


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## Soil – pH – 5.8-6.8



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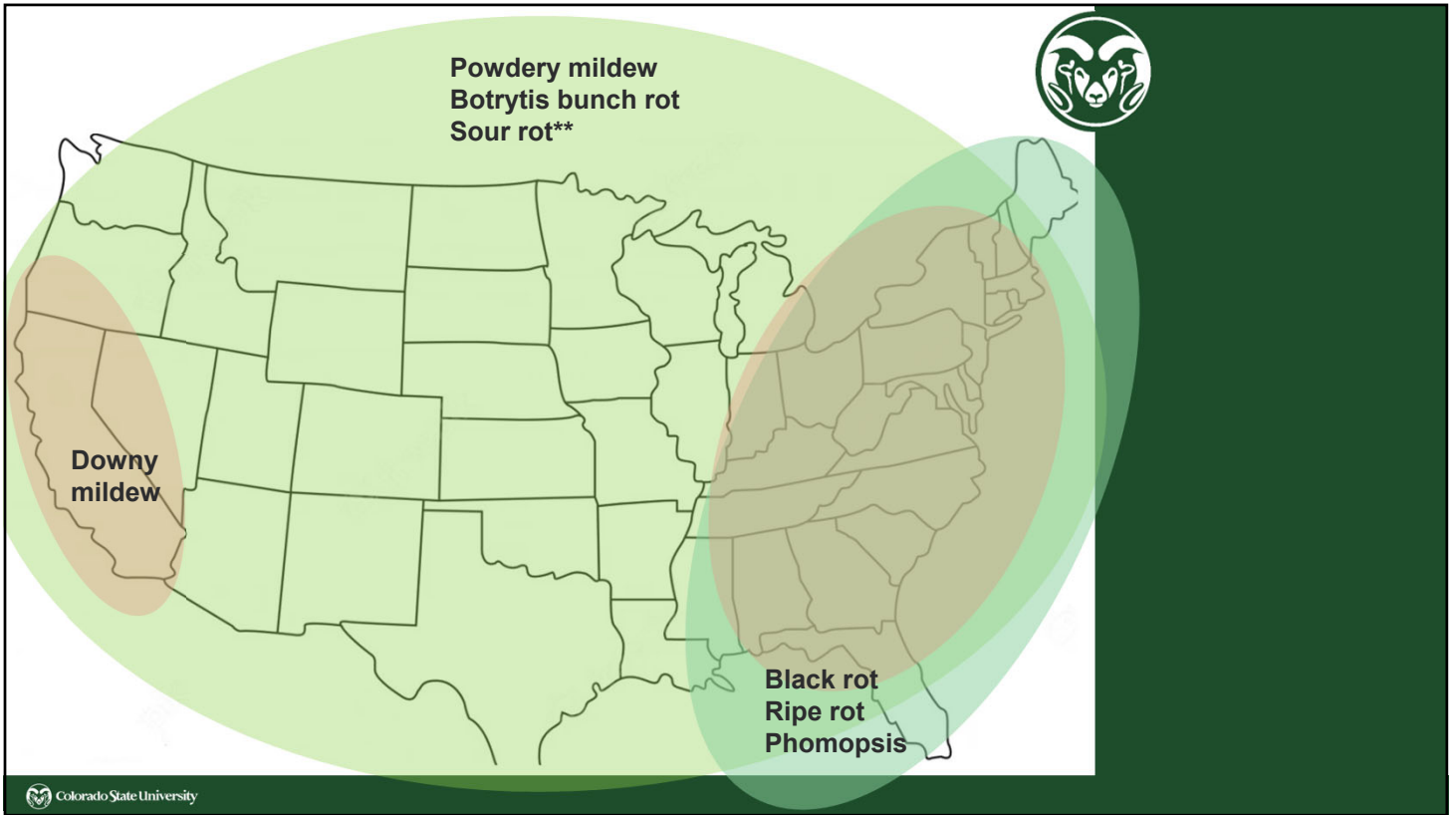


## Season Snapshot

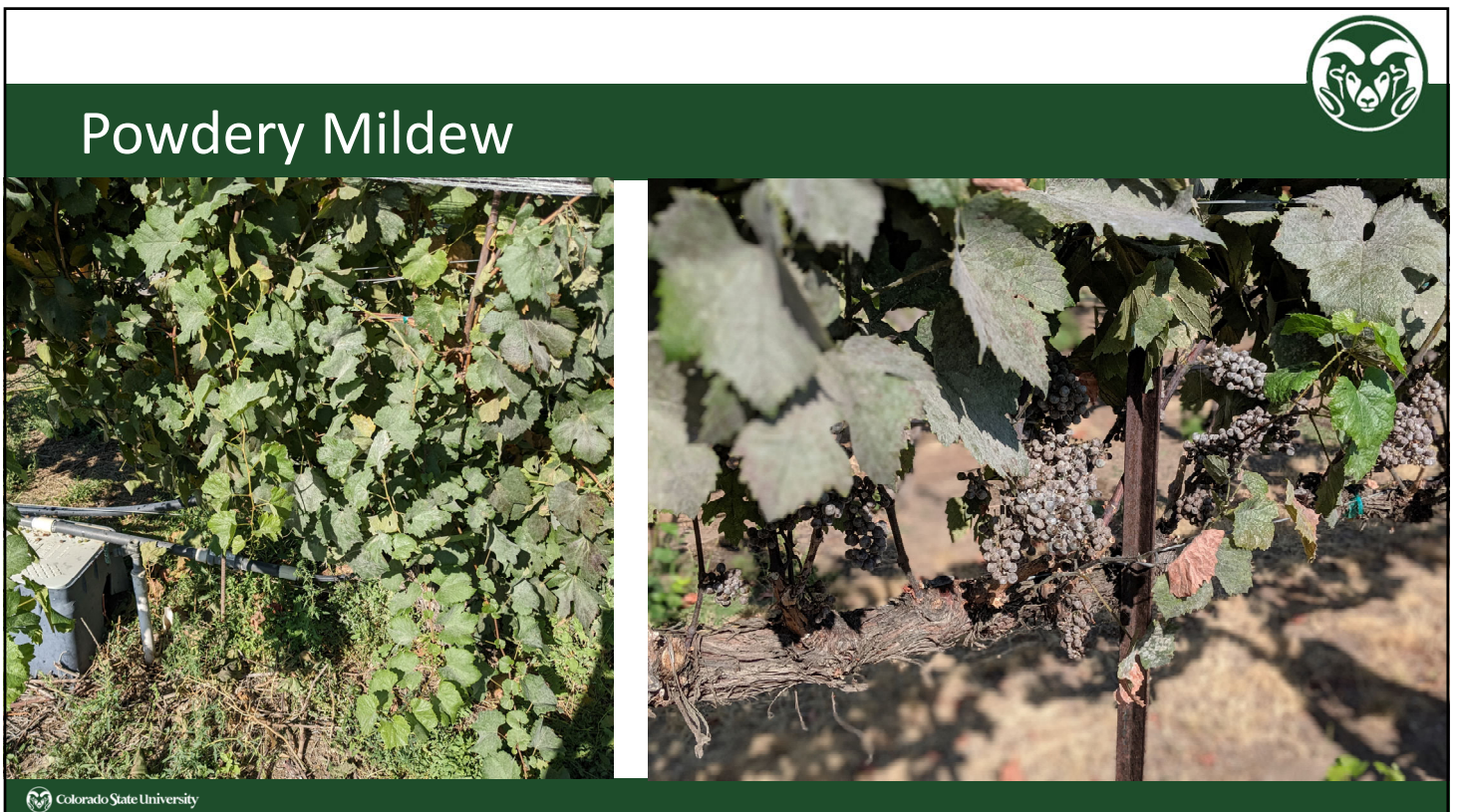


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# Grape phylloxera

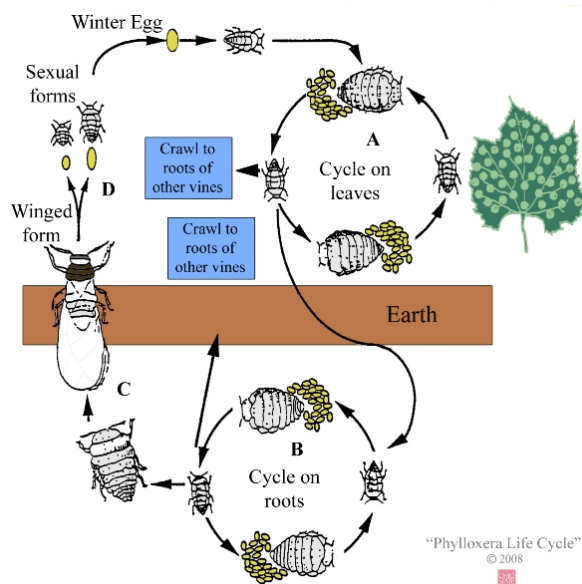


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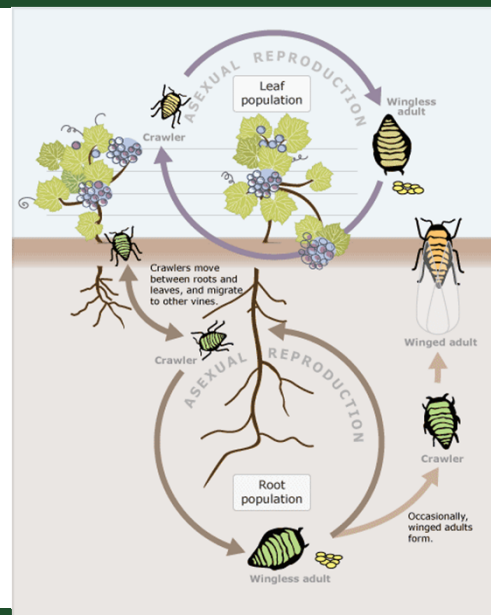
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# Grape phylloxera



"Phylloxera Life Cycle"  
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## Grapevine Leafroll Disease



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## Crown Gall



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